Claims

1. An inductive flow meter for electrically conductive liquids,

- having a flow channel section (1) of essentially circular cross section that is electrically insulating at least on its inner side;
- having at least one pair of electrodes (2, 3) that are situated diametrically opposite one another and are electrically coupled to the electrically conductive liquid; and
- having a magnetic field generation system (7) that is formed either from a magnetic closed circuit (20) with a field coil and with pole shoes (7P) that surround the flow channel section (1) over a specific axial length (b) and at a specific angle of wrap ($2\varphi_0$), or by a field coil arrangement (7L) that surrounds the flow channel section (1) over a specific axial length (b) and at a specific angle of wrap ($2\varphi_0$), and which system generates a magnetic field that penetrates the flow channel interior in the region upstream and downstream of the measuring electrodes (2, 3) as well as between the latter and is oriented substantially perpendicular to the connecting straight line between the measuring electrodes and perpendicular to the flow channel longitudinal axis (Z), and whose field lines respectively penetrate the flow channel inner wall in a restricted fashion on active area arrangements (Fa, Fb, Fc, Fd, Fe, Ff) that are positioned between the measuring electrodes (2, 3) and extend circumferentially in accordance with said angle of wrap ($2\varphi_0$) and axially in accordance with said axial length (b);

characterized in that, in a developed presentation of the flow channel inner wall, bounding straight lines (T1, T2) that are laid tangentially against the active area arrangements (Fa, Fb, Fc, Fd, Fe, Ff) and touch the active area arrangements at two points from

outside, converge in pairs in the direction of the respective location of the measuring electrodes (2, 3), and there are located between the respective two points of contact concave regions (K) in which the boundary lines of the active area arrangements have no points of contact of any sort with the tangential bounding straight lines.

2. The inductive flow meter as claimed in claim 1, characterized in that the circumferential extent ($2\varphi_0$) of the active area arrangement is 125° to 145°, or at least 120°, preferably more than 140°.

3. The inductive flow meter as claimed in claim 1 or 2, characterized in that each active area arrangement (Fa - Ff) has at least 65%, preferably more than 75% of its areal content in a circumferential region from the circumferential center, positioned symmetrically between the measuring electrodes (2, 3) in accordance with $\varphi=0$ up to $\varphi=\pm\varphi_0/2$, and respectively correspondingly has at most 35%, preferably less than 25% of its areal content in the circumferential region from $\varphi=\pm\varphi_0/2$ to $\varphi=\pm\varphi_0$.

4. The inductive flow meter as claimed in one of claims 1 to 3, characterized in that the active area arrangements are each inherently closed formations.

5. The inductive flow meter as claimed in one of claims 1 to 3, characterized in that the active area arrangements are each not inherently closed areal formations.

6. The inductive flow meter as claimed in claim 5, characterized by interposed partial active areas (Fu) through which there penetrate field lines of magnetic fields that are oriented opposite to the field lines penetrating the active area arrangements, and are generated by additional magnetic field generation

systems that include additional magnetic closed circuits or additional field coil arrangements (figure 7F).

7. The inductive flow meter as claimed in one of claims 1 to 6, characterized in that the density of the magnetic field lines in the active area arrangements is substantially constant throughout the latter.